

APPENDIX C

OPTION 2 M

INTEGRATED NORTHEAST MARKET CONCEPT

**BUSINESS PLAN
FOR THE DEVELOPMENT AND IMPLEMENTATION
OF A SINGLE REGIONAL TRANSMISSION ORGANIZATION
FOR THE NORTHEASTERN UNITED STATES**

September 10, 2001

Option 2 M

Integrated Northeast Market Concept

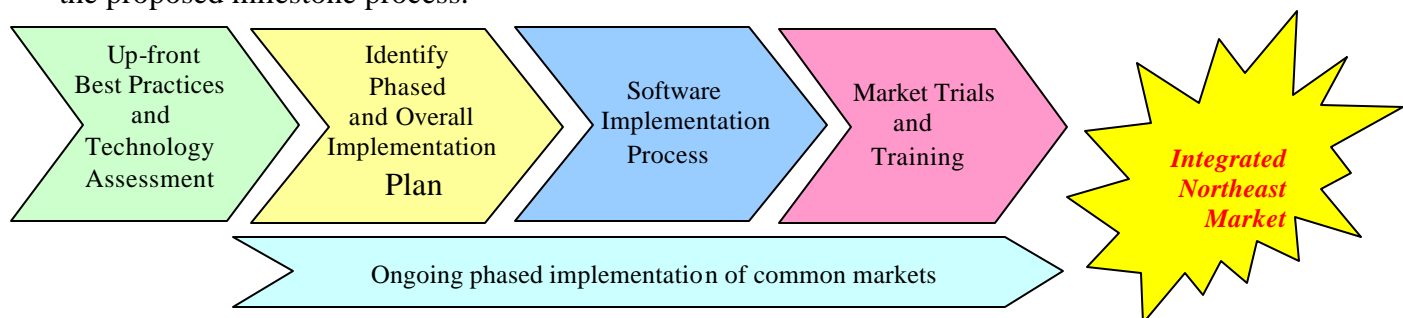
The Integrated Northeast Market Concept (“INM”) expeditiously establishes a common market design while ensuring reasoned adoption of best practices. It provides an initial period for assessment of best practices and technology, through a process driven by an independent Board with meaningful stakeholder input, followed by phased implementation of common markets based on best practices identified during the assessment period, which can begin operation within 12 months of the Commission’s Order. Phased implementation enables market systems that require little if any modification to accommodate best practices to be implemented expeditiously, thereby bringing associated benefits to the market place as soon as possible. Implementation of best practices and full operation of integrated Northeast RTO markets would continue and be completed within 3 years from the Commission’s Order. By taking some initial time up front, this schedule assures that reliability and market efficiency will be protected through the accelerated and supervised assessment and implementation of best practices *prior* to the implementation of the planning and costly software development stage, and provides for effective startup of the integrated Northeast markets.

I. Overview and Executive Summary

The INM will result in a single Northeast market being phased-in over a 12 to 35-month period. The proposal gives adequate time for the development of an implementation plan to assess:

- Best practices that must be included in the integrated RTO market design;
- Common market best practices that can be implemented on an accelerated basis to enhance market efficiency; and
- Technology requirements required for reliable, efficient operation of the single Northeast RTO.

Once the assessment is completed, software implementation proceeds with phased implementation incorporating necessary best practices to maintain reliability and economic efficiency followed by implementation of the full RTO market design with best practices. This approach will produce the shortest and most cost-effective process to achieve a single Northeast market. The following diagram shows the major elements of the proposed milestone process.



Shortchanging this process or not identifying and including best practices in the RTO implementation process could result in inefficient markets and associated increased costs to consumers, the need to modify software and other operational tools over and over again and delays or regression in establishing a workably competitive, single Northeast market. By evaluating reliability, economic and operational consequences up front through the best practice and technology assessment process, benefits can be achieved within 12 months. Moreover, the creation of a single Northeast market and concrete savings to consumers may be called into question without an initial prudent review of best practices.

II. Description of the INM

The INM is structured to take full advantage of existing ISO systems and technology supplemented by best practices from New York and New England in order to implement a reliable and efficient markets in a timely and cost-effective manner. The design is premised on the concept that Northeast markets can be established in a way that integrates best practices from New York and New England while still delivering working markets in less than 3 years. Determination of the products provided by the INM is dependent upon the completion of the best practices and technology assessment which identifies best practices. Some of the deliverables that may be readily adopted on a phased basis include:

- Region-wide ICAP markets
- Common TCCs/FTRs
- Common Communication Tools (CSS/OSS)
- Region-wide transmission planning
- Staged Day-Ahead Market Implementation
- Integrated Transaction Scheduling

Other deliverables will be achieved through the conclusion of the implementation of the ultimate market design using further phased implementation where feasible. When completed in less than 3 years, the INM will provide a single regional market with common market interfaces while maintaining and ensuring regional and local reliability. The deliverables of the INM are as follows:

- Day-ahead energy market
- Real-time energy market
- Financial transmission rights
- Reactive services market
- Operating reserves market
- Demand response program
- Generation Information system
- Black start service
- Capacity Adequacy Planning
- Capacity Market

In order to implement the INM, detailed evaluation of the best practices from PJM, New York and New England is required. It is expected that this task will take 3 months to complete. Within these first 3 months, the markets and operations in PJM, New York and New England will be examined to identify the best practices and how those best practices can be incorporated into the INM. This evaluation should include:

- Identifying critical path technological challenges to adapt existing ISO software such that it can solve for New York and New England operational requirements and critical commercial practices, and if so, whether they can be solved upon market start-up; and
- Identifying all of the significant reliability and financial impacts of the New York and New England operational requirements and critical commercial practices.

In addition, the best practice evaluation must assess the:

- Operational requirements of gas turbine and hydro dispatch and how to incorporate them into the existing ISO software;
- Possible impacts on interface limits associated with manual operator interventions or solving for individual transmission contingencies with respect to interface limits;
- Handling of operating reserves and other ancillary services markets;
- Treatment of local reliability rules and market power mitigation in the Day-Ahead unit commitment and real-time dispatch software;
- Operation of the Con Edison underground cable system; and
- Treatment and optimization of phase angle regulators.

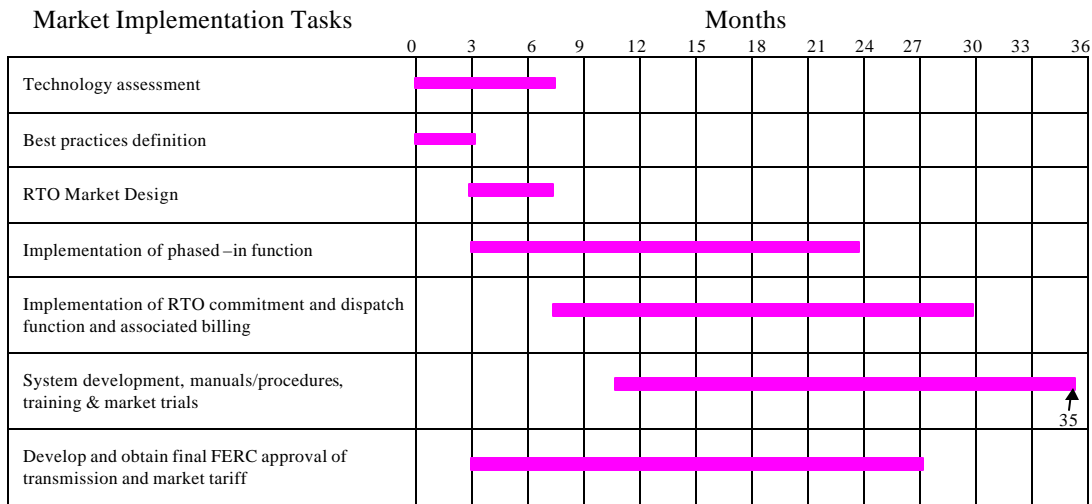
In determining whether an operating, reliability or market rule is a best practice, the costs associated with implementing these items, as well as the costs associated with not implementing these items, must be analyzed. The INM provides that the impact on regional and local reliability must also be considered in the evaluation of best practices.

Another key feature of the INM is the plan's ability to implement significant portions of the market design in a phased-in approach. This will enable the stakeholders to enjoy some of the benefits associated with a common market before the entire market is finalized. As shown on the milestone chart below, the ability to produce phased benefits does not slow the overall implementation of the INM throughout the RTO control area. In order to realize phased benefits, the INM concept calls for a 12 month

process that leads to the live implementation of certain segments of the market by November 1, 2002.

Once the best practices are evaluated, a detailed market specification will be produced. It is anticipated that this task will take approximately 4 months from the completion of the best practice evaluation. During this time, the business rules will be developed and drafted by the RTO and then reviewed and commented on by the stakeholders. After completion of the detailed specifications, the implementation plan will be developed. Simultaneous with this process, Technology Assessment would be conducted.

Milestones for the Implementation of the Integrated Northeast Market Concept Option 2M



The figure above is a high level summary of the INM milestone plan. The main market implementation tasks can be grouped as follows:

- Technology assessment, best practices definition and RTO market design - These three tasks represent parallel activities described above. A high-level market design will define the functions that will be implemented, whether in a phased-in fashion or as part of the initial integrated market. The best practices to be implemented in the various functions will be agreed upon. These two activities drive the technology assessment activity that will determine the implementation approach that will be taken. The 7 month period for this group of tasks provides time for the governance track to determine any type of ITC provisions which may be required for INM implementation.

- Implementation of phased-in functions - Having defined which functions will be phased-in ahead of the fully integrated northeast market, and having determined the best practices associated with those functions, design and implementation of the functions can proceed. As each phased-in function is completed and tested it can become operational.
- Implementation of RTO commitment and dispatch functions and associated billing. Once best practices and technology have been defined, this design and implementation activity can proceed. This task includes the testing of each function on a stand-alone basis until they are ready to be released for market trials.
- System development, completion of manuals/procedures, training and market trials - With the scope of main functions defined and initial tariff work accomplished, the work to develop software systems and market participant, RTO staff and operator manuals and procedures can start. Manuals need to be in place before market participant training can be undertaken. In turn, trained market participants can actively take part in the market trials.
- Develop and obtain final FERC approval of market tariff -Tariff work can start as soon as the RTO market design is completed since it is not dependent on technology or implementation. However, it is envisioned that there will be an interaction with the best practices and implementation activities as certain market rule details get specified. On the other hand, the implementation activity does not need to wait for the tariff to be approved by FERC. However, here too, there are interactions with the implementation activity as the tariff approval process unfolds.

The INM will begin bringing benefits to Northeast consumers within 12 months and lead to a fully functional regional market in the third quarter of 2004.

III. Advantages of the INM

The INM provides certain unique and significant advantages. First, it begins the operation of certain consolidated markets within 12 months. Second, it provides for a much needed and useful technology assessment. This will ultimately lead to the inclusion of necessary best practices to ensure system reliability and economic efficiency.

A. Timely Delivery

The major advantage of the INM concept is its timely delivery of both the final product and the essential phased steps. Initial benefits can commence in 12 months with full completion in less than 3 years.

B. Provides for Best Practices

The New York market has unique commercial and operational features that are necessary ingredients of a fully-functioning RTO. The New York Control area also has certain unique reliability needs that must be maintained. By allocating 3 months up front to evaluate best practices, the INM provides a mechanism that ensures that the reliability and operational needs of New York and New England will be met. It is during these 3 months that these critical commercial, operational and reliability needs and best practices will be identified and worked in the implementation plan. Without this step, these key elements may not be available when the integrated RTO market begins.

C. Provides for Technology Assessment

Rather than allowing software and hardware problems to surface late in the development process, an up front technology assessment provides a mechanism that identifies any such software and hardware problems thereby minimizing the chance that organizational issues could require the midstream re-design of software or new hardware needs identified at the last minute and thus delay the overall schedule. An up front technology assessment will take only 7 months. But this assessment will enable the RTO to identify problems early and ensure that systems are designed in such a way as to achieve their desired functionality. This technology assessment will include testing and analyzing existing software and hardware platforms to see whether and how they can be used in developing the integrated RTO markets.

A crucial element of the INM concept is the use of an independent technology consultant to evaluate and predict the performance of the software that will be utilized in developing the INM. It is essential that an independent party be brought in to provide objectivity and experience in the evaluation of the technology and software being used.

IV. Key Features of the INM

A. Up Front Best Practices Assessment

Assessment of best practices according to the criteria established in the Business Plan prior to the start of the integrated Northeast markets is a key feature of the INM. The primary purpose of the assessment is to identify which best practices are essential to the reliable and efficient operation of the RTO market. Without this up front assessment of essential best practices, adoption of the PJM platform could result in: reliability problems; dysfunctional markets with higher costs to consumers; or delays in implementation caused by the need to retrofit essential best practices after software development has commenced. It would not be reasonable to forego the benefits of essential best practices without evaluating the reliability, economic and operational impacts of doing so.

For example, incorporation of reliability requirements, including local reliability rules, as simultaneous constraints to be considered for the operation of the energy and ancillary

services markets may be required to achieve consistency between prices and reliability. Higher costs to consumers may result if the following kind of simultaneous features are not included in the day-ahead unit commitment:

- All energy, reserves and regulation markets simultaneously solved for in determining the day-ahead commitment and prices;
- Reliability constraints (both physical system constraints and forecasted operational constraints such as the forecasted load) modeled so commitment is feasible from a reliability point of view; and
- System controls such as phase angle regulators are modeled to optimize the use of the transmission system much as operators do so in real-time.

Failure to ensure that adequate market mitigation best practice measures are in place up front will impede the transition to workably competitive markets. This too may result in higher costs to consumers and improper signals to market participants.

Another issue that must be assessed is generation dispatch, control and response. The power grid must be operated as close to limits as possible consistent with maintaining reliability under normal and contingent states.

Unnecessary and costly delays also may result if the bid to bill system is not properly designed and tested at the outset of the transition to a single Northeast market. An independent evaluation of bid to bill computations is essential to ensure that they reflect the approved RTO tariff. A performance assessment of the ability of the bid to bill system to provide a smooth and timely issuance of billing statements also is required.

B. Up Front Technology Assessment

In developing a single Northeast market, it is imperative that the milestones and schedules be realistic and account for all of the key facets of systems development. One of the crucial aspects of systems development is the performance of an up front Technology Assessment. This is imperative to identify performance problems early on. This will ensure that systems are designed so that they provide the desired level of performance. While the PJM software is able to effectively run the PJM market, it is not definitively known whether this platform can readily be applied to the unique market and operational circumstances that exist in New York and New England. Careful testing and analysis is required to ensure that PJM's software can be modified to accommodate constraints for which the existing software was never designed or tested. At Judge Young's request, technical experts from all 3 ISOs and several other parties to this mediation concluded that a technology assessment effort was necessary, including the actual testing of the performance of existing software.

Another key aspect of the INM is that independent technology consultants will be brought in to provide an objective assessment of the performance limitations of the

existing software systems. A key untested question is whether the security constrained unit commitment software (“SCUC”) is able to handle the larger size of the Northeast RTO and more complex system within a reasonable execution time.

Given that there are functioning ISOs with active markets, it is possible to have phased steps for moving towards a common market provided that the implementation of these phased steps do not cause a delay in the overall schedule for implementing the initial RTO system. This is one of the more flexible features of the INM concept. Accordingly, the milestones have tasks associated with the identification and implementation of such phased steps in parallel with other initial tasks.

Proper testing of software and the conduct of comprehensive market trials are necessary to ensure the success of the startup of the RTO. Appropriate provisions for these tasks have been made in the milestone schedule.

The INM has also been designed to accommodate the need for disaster recovery. For example, the RTO needs to be designed with redundant computer facilities. There must be provisions for backup control centers that can step in and assume the functions of the RTO in the case of failure of critical functions at the RTO. A separate back-up facility or facilities would be required to take over in the event of failure of the RTO’s primary system.

C. Single Integrated Northeast Market

Software systems must be in place to run the integrated market and to operate the grid. Currently each ISO has a central market system with seasonal, day-ahead and real-time markets. The Business Plan identifies major differences in scope between the current ISOs. The INM assumes that these differences have been rationalized considering the reliability and market efficiency principles previously described. In the end, the INM will result in a single integrated market system. The technology assessment task must evaluate which of the existing ISO software systems becomes the starting point or whether a whole new system is required. The governing principle must be to produce the desired end result in the least time and cost.

Upon startup of the integrated RTO markets, the ISO control centers will remain as regional control centers. The real-time dispatch of the grid is more than just complex software. Communications and data acquisition are key functions. ISOs depend on massive amount of real-time data being collected through existing utility control centers every few seconds and must interface with generating units and utility control centers for control. The actual generator control signals sent are not of the same kind for all ISOs. Initially, the centralization of the real-time dispatch and control is outside the scope of the implementation of the RTO since this would add a considerable amount of time to the schedule and unnecessarily delay the achievement of an integrated RTO market. Over time, improvements in communications and control functions may be centralized into the RTO operations.

Real-time operation also involves the existing utility control centers. These centers, staffed on a 24-hour basis, are the first line of defense when there are problems in the grid. These utility centers are not only the link to lower voltage portions of the grid but are in some cases directly responsible for the reliability of portions of the transmission system not monitored and secured by the associated ISO. In some cases this is an outcome of the complexity of the local transmission system as in the case of New York City, which require extensive and pointed experience to maintain reliable operation. It is anticipated that except for serious emergency cases that require immediate response, utility control centers must get approval before they can take actions affecting the transmission system and/or associated interconnected generation.

Within the INM, adequate market monitoring and mitigation must be implemented to address instances of market power abuse or conditions where lack of sufficient competition cannot justify the existence of a workable competitive market. Consumers must be assured that prices are transparent and are the result of competition.

Disaster recovery must be considered in the design of the INM. This takes different forms. The RTO itself needs to be designed with redundant computer facilities with fail over capability to the healthy pair. Similar to the existing ISOs, there must also be provisions for the failure of critical functions at the RTO that renders it unworkable. In this case, a separate facility would be required to take over until the RTO returns to normal operation. Within the RTO, there should be facilities that store sensitive price and billing data to minimize the probability that such information can be destroyed.

In the event that ITCs are established, there may need to be provisions for integrating ITC operations into the functioning of the INM.

The following figure encapsulates the RTO design concept described above.

